

What is claimed is:

1. A labor reduction type agricultural chemical spraying system having an automatic hose winding and unwinding apparatus, comprising:

a frame in which a motored sprayer connected with an engine is installed;

a reel rotatably installed in the frame wherein a hose is wound onto the reel;

a first driving motor driven in both directions for rotating the reel in normal and reverse directions in accordance with a remote control signal;

a rotary shaft rotating by a driving force from the rotary shaft of the reel and reciprocating a movable piece engaged to an upper side in the left and right directions with respect to the reel;

a second driving motor installed on the movable piece in cooperation with the first driving motor and driven in the normal and reverse directions in accordance with a remote control signal; and

a pair of rollers that are installed in the movable piece and are rotatably connected with the second driving motor and tension an outer surface of the hose, and unwind the hose from the reel.

2. The system of claim 1, wherein said roller includes:

a driving roller fixed to a shaft of a driven gear engaged with a driving gear connected with the second driving motor; and

a driven roller that is rotatably installed in the movable piece opposite to the driving roller and closely contacts the hose to the driving roller for thereby moving the hose.

3. The system of claim 2, wherein said driven roller is elastically installed and pulls the driven roller in the direction of the driving roller by an elastic member fixed to the movable member having one end fixed to the movable piece and the other

end being slidable with respect to an engaging groove of the movable piece.

4. The system of claim 3, further comprising:

a fixing rod provided at left and right sides of the movable member and protruded from an elongated hole formed at left and right sides of the movable piece; and

a pair of guiders formed on an upper side of a supporting rod fixed to the fixing rod and having a ring adapted to support the hose passing between the driving roller and the driven roller.

5. The system of claim 4, further comprising:

a twisting prevention guide member fixed to an outer guide among the guiders and having an outer lateral surface rounded in a radius direction for thereby preventing a twisting of the hose fed between the driving roller and the driven roller.

6. The system of claim 1, wherein said hose assistant pulling apparatus installed between the reel and a nozzle body fixed to an end of the hose and adapted to pull the hose includes:

a driving motor that is installed in a housing and is driven in normal and reverse directions based on a driving power and cooperates with the first and second driving motors;

a main reel fixed to the rotary shaft of the driving motor and winding the hose from the reel by at least more than one time thereonto;

an assistant reel rotatably installed at the front end rear sides of the main reel and having a groove in an outer surface for accommodating the hose therein; and

a tensioning reel that is rotatably installed at a portion opposite to the

assistant reel and tensions the hose with respect to the assistant reel for thereby preventing a slip of the hose.

7. The system of claim 6, further comprising:

5 a position adjusting plate that is integrally provided at a lower portion of the support rod having the tensioning reel fixed to its upper end and has an engaging groove locked by a lever fixed to the housing.

8. The system of claim 1, further comprising a rotation means including:

10 a fixing plate fixed to the frame;

a rotation plate rotatably engaged to the fixing plate wherein the reel is mounted on the rotation plate; and

15 a stopper detachably engaged to a through hole respectively formed in the fixing plate and the rotation plate and adapted to prevent a rotation of the rotation plate with respect to the fixing plate.

9. The system of claim 8, wherein said rotation means includes:

a pair of cut-away grooves symmetrically formed at left and right sides of the rotation plate in an arc shape; and

20 a guide pin protruded from the fixing plate and engaged to the cut-away groove for thereby rotating the rotation plate with respect to the fixing plate within a set angle range.

10. The system of claim 8, further comprising:

25 a fixing groove formed on an outer surface of the rotation plate at a regular interval;

a control pin fixed to the frame and being selectively and detachably

engaged to the fixing groove; and

an elastic member elastically biasing a construction that the control pin is engaged to the fixing groove as an initial state.

5 11. The system of claim 1, further comprising:

a pair of guide rollers slidably engaged to a pair of guide rails integrally formed in the frame and supporting the hose wound onto the reel and preventing a twisting of the hose.

10 12. The system of claim 1, further comprising:

a fixing shaft formed in the frame in a rear side of the reel;

a tensioning bar having one end fixed to a rotation ring rotatably engaged to the fixing shaft and the other end that is rotated in a radius direction of the reel with respect to the fixing shaft as a center shaft;

15 an elastic member fixed to the fixing shaft and elastically biases a construction that the tensioning bar is tensioned in the radius direction of the reel based on the winding amount of the hose as an initial state; and

a movable piece integrally formed in the rotation ring and adapted to turn off the power of the first driving motor by tensioning a contact terminal of a limit switch  
20 fixed to the fixing shaft based on a rotation of the tensioning bar.

13. The system of claim 1, further comprising:

a rotary shaft rotated by a driving force from the rotary shaft of the reel;

a guider engaged to the rotary shaft and reciprocating in the left and right  
25 directions along a guide rail;

a driving roller engaged to a spline shaft rotatably connected with the rotary shaft and tensioning an outer surface of the hose;

a movable member having an upper end engaged to the spline shaft and a lower end engaged to the guider for thereby moving the driving roller along the guider; and

5 a driven roller rotatably fixed to the rotary shaft formed opposite to the spline shaft and being moved in the left and right directions.

14. The system of claim 13, further comprising:

a pair of guide rails formed in the front sides of the spline shaft and the rotary shaft for thereby preventing a twisting of the hose.